

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Whittington, K.

Art Unit: 2862

Docket No. 3807

In re:

Applicant: RETTIG, R., et al

Serial No.: 10/588,678

Filed: August 8, 2006

BRIEF ON APPEAL

February 24, 2009

Commissioner for Patents
P O Box 1450
Alexandria, VA 22313-1450

This is a Brief on Appeal from the final rejection of Claims 1-3, 5, 6, and 8-10 by the primary Examiner.

REAL PARTY IN INTEREST

The real party in interest in this application is Robert Bosch GmbH, having a business address of Postfach 30 02 20, D-70442 Stuttgart, Germany.

RELATED APPEALS AND INTERFERENCES

There are no pending, appeals, interferences or judicial proceedings known to appellant, the appellant's legal representative, or assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

The present application contains Claims 1-3, 5, 6, and 8-10.

Claims 4 and 7 have been cancelled.

Claims 1-3, 5, 6 and 8-10 have been rejected by the primary Examiner.

The rejected Claims 1-3, 5, 6 and 8-10 are now appealed.

STATUS OF AMENDMENTS

In the present application the final Office Action was issued on October
27, 2008

No Amendment was filed after the issuance of the final Office Action.

SUMMARY OF CLAIMED SUBJECT MATTER

The present application deals with a magnetic sensor arrangement.

In the magnetic sensor arrangement as defined in Claim 1, magnetically sensitive sensor elements 7, 8 are provided, whose electrical properties are changeable as a function of a magnetic field that a moving, passive transmitter element 11 is able to influence, with a magnetic field being substantially perpendicular to the sensor elements 7, 8. This is disclosed in the paragraph bridging pages 7 and 8 and also in the paragraph bridging pages 9 and 10, and shown in Figures 1 and 5.

The two sensor elements 7, 8 are in a gradiometer arrangement and each is respectively associated with one of two regions 4, 5 of a permanent magnet embodied in the form of a gap magnet 2, with the regions spaced apart from each other by a predetermined distance (sa). This is disclosed for example on page 8, in the paragraph in lines 10-18 of the specification and shown in Figures 1 and 2.

The sensor elements 7, 8 are arranged one after the other in a direction of movement of the transmitter element 11. This is disclosed in the paragraph bridging pages 9 and 10 and shown in Figure 5.

The sensor elements 7, 8 are associated with edges of a gap 21 in a rotary direction of the transmitter element. This is disclosed on page 7, lines 13-19, and in the paragraph bridging pages 10 and 11 and shown in Figures 7 and 9.

The magnetic regions 4, 5 and the permanent gap magnet 2, 20 in terms of the dimensions (h, b, t), the gap width (sa), the gap depth (st) and their positions in relation to the sensor elements 7, 8, are situated so as minimize the offset of the output signal of the sensor elements 7, 8 in the gradiometer arrangement. This is disclosed for example on page 10 in the paragraph in lines 6-11 and shown in Figure 6.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

In the Final Office Action the Examiner rejected Claims 1, 3, 8 and 10 under 35 USC 102(b) as being anticipated by the patent to Eckardt et al.

Therefore a first ground of rejection to be reviewed on appeal is whether Claims 1, 3, 8 and 10 are rejectable under 35 USC 102(b) over this reference.

Claims 1 and 2 were rejected by the Examiner in the Final Office Action under 35 USC 102(b) over the U.S. patent to Wilkinson.

Therefore a second ground of rejection to be reviewed on appeal is whether Claims 1 and 2 are rejectable under 35 USC 102(b) as being anticipated by the U.S. patent to Wilkinson.

Claim 1 was also rejected in the Final Office Action under 35 USC 102(b) as being anticipated by the U.S. patent to Wu.

Therefore a third ground of rejection to be reviewed on appeal is whether Claim 1 is rejectable under 35 USC 102(b) over the U.S. patent to Wu.

Claims 5 and 6 were rejected under 35 USC 103(a) in the last Office Action as being unpatentable over the U.S. patent to Wu in view of the U.S. patent to Higgs et al.

Therefore a fourth ground of rejection to be reviewed on appeal is whether Claims 5 and 6 are rejectable under 35 USC 103(a) over the U.S. patents to Wu and Higgs et al.

Finally, Claim 9 was rejected under 35 USC 103(a) as being unpatentable over the U.S. patent to Eckardt in view of the U.S. patent to Higgs.

Therefore a fifth ground of rejection to be reviewed on appeal is whether Claim 9 is rejectable under 35 USC 103(a) over the combination of these two references.

ARGUMENT

Argument Related to First Ground of Rejection

to be Reviewed on Appeal

In the patent to Eckardt, it can be seen from consideration of Figures 8, 9 and 10 with the corresponding description that here two measuring elements (18) provide measurements and a difference is formed, but the arrangement in this reference is different from the arrangement which is now defined in Claim 1. From consideration of Figure 9 of the patent to Eckardt, it can be seen that the slot (17) is formed in the movement direction of the transmitter wheel. Further, both sensor elements (18) are always arranged over the slot (17) as shown in Figure 8. The Examiner indicated that in the patent to Eckardt the slot shown in Figure 9 must be turned by 90 degrees to be similar to the present invention. This turning by 90 degrees however is not sufficient, since thereby the sensor elements would be arranged no longer in the movement direction one after the other, but instead perpendicularly near one another to the movement direction. Therefore, the gradiometer principle will no longer be achieved. It must be also recognized that the arrangement of both sensor elements one after the other in the movement direction must be maintained and furthermore both sensor elements must be arranged at the edges of the gap in the applicant's invention.

It is believed to be clear that this reference does not teach the new features of the present invention which are now defined in amended Claim 1.

Claim 1 was rejected over the patent to Eckardt under 35 USC 102(b) as being anticipated. In connection with this it is believed to be advisable to cite the decision In Re: Lindenman Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir 1984) in which it was stated:

“Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.”

Definitely, the patent to Eckardt does not disclose each and every element of the present invention as defined in Claim 1, and as explained hereinabove, and therefore the anticipation rejection of Claim 1 should be considered as not tenable and should be withdrawn.

As for Claims 3, 8 and 10 rejected over the same reference, these claims depend on Claim 1, they share its allowable features, and therefore it is respectfully submitted that they should be allowed as well.

This is how, in Appellants' opinion, the first grounds of rejection to be reviewed on appeal has to be taken care of, in particular by reversing the Examiner's rejection of Claims 1, 3, 8 and 10 under 35 USC 102(b).

Argument Related to Second Ground of Rejection
to be Reviewed on Appeal

In connection with the Examiner's rejection of Claims 1 and 2 under 35 USC 102(b) as being anticipated by the U.S. patent to Wilkinson, it is respectfully submitted that the device disclosed in the patent to Wilkinson does not operate in accordance with the gradiometer principle. It is true that the device disclosed in the patent to Wilkinson has the number of the magnets and the sensor elements substantially corresponding to the number of the magnets and the sensor elements in the magnetic sensor arrangement in accordance with the applicant's invention. However, the magnetic sensor arrangement is still different from the arrangement disclosed in the patent to Wilkinson. In the patent to Wilkinson the magnetic sensor arrangement and its components are designed so that the magnetic field in the arrangement of the magnets are different. Figures 1 and 2 show a sensor module 10 which contains the magnet component M. The polarity of the component M is not exactly explained in Figures 1 and 2 or in column 7, lines 32-39 of this reference, while the remaining figures show a somewhat similar flux arrangement. In column 12, lines 5-7, curved magnets M3 are mentioned by the Examiner with respect to Figure 6. In this case, however, there is no gap 3 in the magnets, which is defined in Claim 1 of the present application. The elements E1 and E2 are located directly, with the distance between E1 and E2 on the magnets M3.

It is therefore believed to be clear that the U.S. patent to Wilkinson does not disclose the new features of the present invention which are now defined in Claim 1.

The present invention as defined in Claim 1 cannot be anticipated by the patent to Wilkinson.

As for the Examiner's rejection of Claim 2 as being anticipated by the patent to Wilkinson, this claim depends on Claim 1, it shares its allowable features, and therefore it should be allowable as well.

In view of the above it is respectfully submitted that the Examiner's rejection of Claims 1 and 2 over the patent to Wilkinson under 35 USC 102(b) should be reversed.

Argument Related to Third Ground of Rejection
to be Reviewed on Appeal

The arrangement disclosed in the patent to Wu also does not operate in accordance with the gradient principle. As for the number of the magnets and the sensors, they substantially correspond to those defined in Claim 1. However, the arrangement disclosed in the patent to Wu is different.

As mentioned in column 4 of the Wu patent, the sensor 12 in Figure 2 measures the upper tooth surface 30, while simultaneously the sensor 14 is disposed proxima to a space 28. The magnet 20 is U-shaped, so that the sensor 12 is located near the South Pole and the sensor 14 is located near the North Pole, as can be seen from the drawings, in particular from Figure 1.

In the applicant's invention however both sensors have a magnetic field with a direction B.

The patent to Wu also does not disclose the new features of the present invention as defined in Claim 1.

As for the anticipation rejection of Claim 1 based on the U.S. patent to Wu, it is respectfully submitted that the legal decision cited hereinabove is fully applicable with respect to this rejection, and it is also respectfully submitted that the anticipation

rejection of Claim 1 over this reference should be considered as not tenable and should be withdrawn.

Argument Related to Fourth Ground of Rejection

to be Reviewed on Appeal

As for the Examiner's rejection of Claims 5 and 6 under 35 USC 103(a) over the patent to Wu in view of the patent to Higgs et al, it is respectfully submitted that none of these two references disclose the new features of the present invention defined in amended Claim 1, from which Claims 5 and 6 now depend.

None of the references also provide any hint or suggestion for these features.

Therefore, it is respectfully submitted that this rejection should be considered as not tenable with respect to Claims 5 and 6 and also, with respect to Claim 1, the broadest claim on file, and should be withdrawn as well.

Argument Related to Fifth Ground of Rejection
to be Reviewed on Appeal

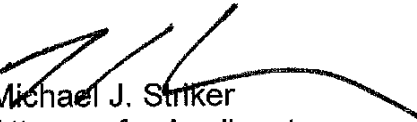
Claim 6 was rejected by the Examiner under 35 USC 103(a) over the U.S. patent to Eckardt in view of the U.S. patent to Higgs.

None of these references disclose the new features of the present invention as defined in Claim 1, from which Claim 9 depends. None of these references also disclose any hint or suggestion for such features.

It is therefore respectfully submitted that the rejection of Claim 9 under 35 USC 103(a) should be considered as not tenable and should be withdrawn as well.

Reconsideration and allowance of the present application with all the claims currently on file is most respectfully requested.

Respectfully submitted,



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CLAIM APPENDIX

1. A magnetic sensor arrangement, having

- magnetically sensitive sensor elements (7, 8) whose electrical properties are changeable as a function of a magnetic field that a moving, passive transmitter element (11) is able to influence, with the magnetic field being substantially perpendicular to the sensor elements (7, 8),

wherein

- the magnetic sensor arrangement (1) has two sensor elements (7, 8) in a gradiometer arrangement that are each respectively associated with one of two regions (4, 5) of a permanent magnet embodied in the form of a gap magnet (2), which regions are spaced apart from each other by a predetermined distance (sa),

- the sensor elements (7, 8) are arranged one after the other in a direction of movement of the transmitter element (11),

- the sensor elements (7, 8) are associated with edges of a gap (21) in a rotary direction of the transmitter element,

- the magnetic regions (4, 5) and the permanent gap magnet (2; 20) – in terms of the dimensions (h, b, t), the gap width (sa), the gap depth (st), and their positions in relation to the sensor elements (7, 8) – are situated so as to minimize the offset of the output signal of the sensor elements (7, 8) in the gradiometer arrangement.

2. The magnetic sensor arrangement as recited in claim 1,

wherein

- the gap (21) has a contour with a wedge-shaped narrowing in the direction of the gap depth (st) of the permanent gap magnet (20; 23).

3. The magnetic sensor arrangement as recited in claim 1,

wherein

- the gap of the permanent gap magnet (2) has a rectangular contour.

Claim 4 cancelled.

5. The magnetic sensor arrangement as recited in claim 1,

wherein

- flux-conducting plates (9, 10) are positioned between the sensor elements (7, 8) and the magnetic regions (4, 5).

6. The magnetic sensor arrangement as recited in claim 5,

wherein

- each of the flux-conducting plates (24) is embodied in the form of a compact element into which the gap (21) is integrated.

Claim 7 cancelled.

8. The magnetic sensor arrangement as recited in claim 1,
wherein

- the magnetic sensor arrangement (1) is used to detect the rotation angle of a wheel (11) serving as the transmitter element, and the circumference of the wheel (11) is provided with teeth (12) in order to influence the magnetic field in the region of the magnetic sensor arrangement (1).

9. The magnetic sensor arrangement as recited in claim 8,
wherein

- the wheel (11) is embodied in the form of a steel wheel.

10. The magnetic sensor arrangement as recited in claim 1,
wherein

- the sensor elements (7, 8) are magnetoresistive XMR sensors.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.